

FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT

TABLE OF CONTENTS

INTRODUCTION	1
BACKGROUND INFORMATION	2
DESCRIPTION OF THE FACILITY	2
History	2
Collection System Status	2
Treatment Processes	2
Discharge Outfall	3
Residual Solids	3
PERMIT STATUS	3
SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT	3
WASTEWATER CHARACTERIZATION	3
SEPA COMPLIANCE	4
PROPOSED PERMIT LIMITATIONS	4
DESIGN CRITERIA	4
TECHNOLOGY-BASED EFFLUENT LIMITATIONS	5
SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS	6
Numerical Criteria for the Protection of Aquatic Life	6
Numerical Criteria for the Protection of Human Health	6
Narrative Criteria	6
Antidegradation	6
Critical Conditions	7
Mixing Zones	7
Description of the Receiving Water	7
Surface Water Quality Criteria	7
Consideration of Surface Water Quality-Based Limits for Numeric Criteria	8
Whole Effluent Toxicity	9
Human Health	10
Sediment Quality	10
GROUND WATER QUALITY LIMITATIONS	10
COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED FEBRUARY 2, 1996	10
MONITORING REQUIREMENTS	11
LAB ACCREDITATION	11
OTHER PERMIT CONDITIONS	11
REPORTING AND RECORDKEEPING	11
PREVENTION OF FACILITY OVERLOADING	11
OPERATION AND MAINTENANCE (O&M)	11
RESIDUAL SOLIDS HANDLING	12
PRETREATMENT	12
FEDERAL AND STATE PRETREATMENT PROGRAM REQUIREMENTS	12
WASTEWATER PERMIT REQUIRED	12
DUTY TO ENFORCE DISCHARGE PROHIBITIONS	12
OUTFALL EVALUATION	13
GENERAL CONDITIONS	13

FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT

PERMIT ISSUANCE PROCEDURES	13
PERMIT MODIFICATIONS	13
RECOMMENDATION FOR PERMIT ISSUANCE	13
REFERENCES FOR TEXT AND APPENDICES.....	14
APPENDIX A--PUBLIC INVOLVEMENT INFORMATION	16
APPENDIX B--GLOSSARY	17
APPENDIX C--TECHNICAL CALCULATIONS	22
APPENDIX D--RESPONSE TO COMMENTS	23

INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits, which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington on the basis of Chapter 90.48 Revised Code of Washington (RCW) which defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A--Public Involvement](#) of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

<u>GENERAL INFORMATION</u>	
Applicant	Carlyon Beach Homeowners Association (CBHA) 2719 Island Drive Northwest Olympia, Washington 98502
Facility Name and Address	Carlyon Beach Wastewater Treatment Plant 2112 Island Drive Northwest Olympia, Washington 98502
Type of Treatment	Secondary Activated Sludge (Sequencing Batch Reactors) with UV Disinfection
Discharge Location	Squaxin Passage, South Puget Sound Latitude: 47° 10' 43" N Longitude: 122° 55' 52" W.
Water Body ID Number	390KRD

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

HISTORY

Carlyon Beach is located at the north end of a peninsula defined by Totten Inlet on the west and Eld Inlet on the east. The plat is approximately 20 miles from the City of Olympia and includes 731 building lots with an average area of 8,000 square feet. The original wastewater treatment plant that served Carlyon Beach was an extended aeration activated sludge package plant with chlorine disinfection that was constructed in 1978. The plant was originally rated as having a capacity of 12,000 gallons per day (gpd). The plant was rebuilt in 1998. The plant is now using sequencing batch reactors (SBRs) with UV disinfection. The new plant has a capacity of up to 120,000 gpd, but Carlyon Beach has requested to be permitted for a discharge of 60,000 gpd, since their environmental impact statement was completed for 60,000 gpd.

COLLECTION SYSTEM STATUS

There is no sewer collection system for the Carlyon Beach community. Primary treatment is provided by individual septic tanks at each home. The septic tanks are followed by holding tanks for the primary effluent. When the holding tank is full, the contents are pumped into a truck, transported to the treatment plant, and deposited into one of the equalization basins. Carlyon Beach owns two 2,000 gallon pump trucks that are used to transport the waste. Most of the holding tanks are on a regular pumping schedule, ranging from once every few days to once a month. Other holding tanks are not on a regular schedule, and are called-in and pumped whenever full.

Carlyon Beach has looked into installing a sewer collection system. While construction of a collection system may occur someday, there are no present plans to move forward with a collection system.

TREATMENT PROCESSES

The plant headworks consist of three 10,000-gallon equalization tanks that receive the waste influent from the pump trucks. The equalization tanks feed two 62,200 gallon SBR basins, which each have a maximum decant volume of 15,500 gallons per cycle. The system is operated for three cycles per day per basin. The SBRs are set on the following schedule: mixed fill phase 30 minute, react fill phase 210 minute, react phase 120 minute, settle phase 60 minute, decant phase 60 minute, and sludge waste phase 5 minute. The maximum decant flow rate is 250 gpm.

The decant from the SBRs discharges to the ultraviolet (UV) light disinfection system. The UV system has two banks of ten lamps each and has a peak flow capacity of 300 gpm. The outfall then discharges to Squaxin Passage. Sludge digestion is done in the original aeration and sludge holding tanks, which have a total volume of 18,520 gallons. The digested sludge is sent to the City of Shelton STP. The plant has a standby generator that can operate the whole plant in case of a power outage.

There is one operator at the plant. The operator also has responsibility with Carlyon Beach water system. Two other employees drive the pump trucks and help out with the operation. The lone operator is a Class I certified operator. The old permit listed the plant as a Class I plant, but since the upgrade in 1998, and a change in WAC 173-230, the plant is really a Class II. The operator plans to pursue his Class II certification, and may be issued a provisional certificate until he can take the Class II examination.

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

There are no industrial or commercial users of the wastewater plant. The Carlyon Beach Homeowners Association (CBHA) plant is not permitted to handle any waste from any industrial or commercial users.

DISCHARGE OUTFALL

Secondary treated and disinfected effluent is discharged from the facility via a 6 inch HPDE pipe into Squaxin Passage in South Puget Sound. The approximately 1,500-foot outfall ends with an 84-foot, eight port diffuser, at a MLLW depth of 11.5 feet.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the SBRs, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Rags, scum, and other debris are disposed of as solid waste. Solids removed from SBRs are held in the aerated sludge tanks. When the sludge tanks are full, the solids are sent to the City of Shelton wastewater treatment plant. These shipments only occur a few times a year.

PERMIT STATUS

The previous permit for this facility was issued on February 2, 1996. The previous permit placed effluent limitations on five-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, and Fecal Coliform bacteria. The limitations in the previous permit were:

Parameter	Monthly Average	Weekly Average
BOD ₅	30 mg/L, 9.5 lbs/day, 85% removal	45 mg/L, 14.3 lbs/day
TSS	30 mg/l, 9.5 lbs/day, 85% removal	45 mg/L, 14.3 lbs/day
Fecal Coliform	200/100 ml	400/100 ml
pH	Shall not be outside the range of 6.0 to 9.0	

An application for permit renewal was submitted to the Department on February 5, 2001, and accepted by the Department on May 8, 2001.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on April 23, 2002. The plant was in good shape and operating well at the time of the inspection.

During the history of the previous permit, the Permittee has remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

Table 1: Wastewater Characterization

<u>Parameter</u>	<u>Data average for last 3 years (2/99-1/02)</u>
Flow, MGD	0.019
pH, units	6.36
BOD ₅ , mg/l	5.9
BOD ₅ , % removal	95.4
BOD ₅ , lbs/day	0.97
TSS, mg/l	5.9
TSS, % removal	85.9
TSS, lbs/day	0.95
Fecal Coliform, /100 ml	2

The Wastewater characterization shows compliant results with the existing permit.

SEPA COMPLIANCE

The facility is in compliance with State Environmental Policy Act (SEPA). The Environmental Impact Statement that was prepared for the plant upgrade was based on a design flow of 60,000 gpd. For the full design flow of 120,000 gpd to be permitted, a new SEPA environmental review would be required.

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT

The design criteria for this treatment facility are taken from the 1997 *Second Addendum to Carlyon Beach Homeowners Association Wastewater Treatment Plant Engineering Report* prepared by H.R. Esvelt Engineering and are as follows:

Table 2: Design Standards for Carlyon Beach WWTP.

Parameter	Permitted Quantity	Design Quantity
Monthly average flow (max. month)	0.060 MGD	0.120 MGD
BOD ₅ influent loading	117 lbs/day	310 lbs/day
TSS influent loading	88 lbs/day	310 lbs/day
Design population equivalent	588	660

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly BOD₅ effluent mass loadings (lbs/day) were calculated as the maximum monthly permitted flow (0.06 MGD) x Concentration limit (30 mg/L BOD₅) x 8.34 (conversion factor) = mass limit 15 lbs/day BOD₅.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 22.5 lbs/day BOD₅.

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

Monthly TSS effluent mass loadings (lbs/day) were calculated as the maximum monthly influent permitted loading (88 lbs./day TSS) x 0.15 = 13.3 lbs./day TSS.

The weekly average effluent mass loading is calculated as 1.5 x monthly loading = 19.8 lbs/day TSS.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the state Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Squaxin Passage which is designated as a Class A marine estuarine receiving water in the vicinity of the outfall. Other nearby point source outfalls include the City of Shelton STP, the Tamoshan STP, the Beverly Beach STP, the Boston Harbor STP, the Seashore Villa STP, and the LOTT STP. Significant nearby non-point sources of pollutants include storm water runoff, failed septic tanks, and agriculture. Characteristic uses include the following:

Class A (Excellent) - water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this receiving water are summarized below:

Fecal Coliforms	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	6 mg/L minimum
Temperature	16 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

Some Ambient monitoring data is available for the area. The area is near commercial shellfish harvest areas that are well monitored. The monitoring for the area found some excursions for temperature at

FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT

station PCK001 between 1991 and 1996. These excursions were deemed to be natural conditions due to solar heating of the surface water, with no direct human caused influence. There is no indication that the discharge from the wastewater plant is having any effect on the ambient conditions.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

Acute mixing zone – 21.2 feet in any horizontal direction from the diffuser section of the outfall. The minimum dilution factor at the boundary of the acute mixing zone is 366.

Chronic mixing zone – 211 feet in any horizontal direction from the diffuser section of the outfall. The minimum dilution factor at the boundary of the chronic mixing zone is 366.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the EPA model UDKHDEN and field measured current speeds, temperature and salinity profiles as listed in the 1992 *Carlyon Beach Homeowners Association Wastewater Treatment Plant Engineering Report*. The Department checked and confirmed the plume study with the EPA models UM and UMERGE, as listed in the 1992 *Memo Review of June 8, 1992, Carlyon Beach Homeowners Association Engineering Report, Appendix E*. The dilution factors have been determined to be:

	Acute	Chronic
Aquatic Life	366	366
Human Health, Carcinogen		366
Human Health, Non-carcinogen		366

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The ambient background data used for this permit includes the following:

Parameter	Value used
Velocity	6.0 cm/sec
Depth	11.5 feet
Temperature	17 °C
pH (high)	8.4

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

Dissolved Oxygen	7.9 mg/L
Salinity	26.5 - 29.6

The impacts of dissolved oxygen deficiency, temperature, pH, fecal coliform, ammonia, metals, and other toxics were determined as shown below, using the dilution factors described above.

BOD₅--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

Temperature--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water temperature at the critical condition is 16°C and the effluent temperature is 22°C. The predicted resultant temperature at the boundary of the chronic mixing zone is 16°C and the incremental rise is 0.016°C.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 366.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxic was determined to be present in the discharge: ammonia. A reasonable potential analysis (See Appendix C) was conducted on this parameter to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for ammonia to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. No valid ambient background data was available for ammonia. A determination of reasonable potential using zero for background resulted in no reasonable potential.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health, and does not contain chemicals of concern based on existing data and knowledge. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittee's to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground, and therefore, no limitations are required based on potential effects to ground water.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED FEBRUARY 2, 1996

Existing Limits	Proposed Limits
BOD ₅ : Monthly Average 30 mg/L, 9.5 lbs/day, 85% removal; Weekly Average 45 mg/L, 14.3 lbs/day	BOD ₅ : Monthly Average 30 mg/L, 15 lbs/day, 85% removal; Weekly Average 45 mg/L, 22.5 lbs/day
TSS: Monthly Average 30 mg/L, 9.5 lbs/day, 85% removal; Weekly Average 45 mg/L, 14.3 lbs/day	TSS: Monthly Average 30 mg/L, 13.3 lbs/day, 85% removal; Weekly Average 45 mg/L, 19.8 lbs/day
Fecal Coliform: Monthly Average 200/100 ml; Weekly Average 400/100 ml	Fecal Coliform: Monthly Average 200/100 ml; Weekly Average 400/100 ml
pH: Shall not be outside the range of 6.0 to 9.0	pH: Shall not be outside the range of 6.0 to 9.0

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved. Monitoring for ammonia is being required to further characterize the effluent.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for treatment plants less than 0.1 MGD average design flow.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited (M244) for: BOD, DO, pH, TSS, and fecal coliform. The facility has accreditation for all parameters in the old permit. For the new permit, monthly ammonia sampling was added and will need to be accredited. The facility presently does ammonia analysis weekly as process control sampling.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. Since the treatment plant has been upgraded since the last O&M manual was submitted in 1996, the proposed permit requires submission of an updated O&M manual for the entire sewage system. The manual should include a schedule for routine inspection and maintenance of the residential holding tanks.

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and state Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the Thurston County Health Department.

PRETREATMENT

Federal and State Pretreatment Program Requirements

Under the terms of the addendum to the “Memorandum of Understanding between Washington Department of Ecology and the United States Environmental Protection Agency, Region 10” (1986), the Department has been delegated authority to administer the Pretreatment Program. Under this delegation of authority, the Department has exercised the option of issuing wastewater discharge permits for significant industrial users discharging to treatment works. Under the requirements of the Pretreatment Program [40 CFR 403.8(f)(1)(iii)], the Department is required to approve, condition, or deny new discharges or a significant increase in the discharge for existing significant industrial users (SIUs) [40 CFR 403.8 (f)(1)(i)].

The Department is responsible for issuing State Waste Discharge Permits to SIUs and other industrial users of the Permittee's system. Industrial dischargers must obtain these permits from the Department prior to the Permittee accepting the discharge (WAC 173-216-110(5)). For this Permittee, the Department would not allow a SIU to discharge to the treatment plant.

The Department requires this Permittee to fulfill some of the functions required for the Pretreatment Program in the NPDES permit (e.g. preventing industrial dischargers to the system). None of the obligations imposed on the Permittee relieve an industrial or commercial discharger of its primary responsibility for obtaining a wastewater discharge permit (if required), including submittal of engineering reports prior to construction or modification of facilities [40 CFR 403.12(j) and WAC 173-216-070 and WAC 173-240-110, et seq.].

Wastewater Permit Required

RCW 90.48 and WAC 173-216-040 require industrial users to obtain a permit prior to discharge of industrial waste to the Permittee's system. This provision prohibits the Permittee from accepting industrial wastewater from any such dischargers without authorization from the Department.

Duty to Enforce Discharge Prohibitions

This provision prohibits the treatment plant from authorizing or permitting an industrial discharger to discharge waste into the plant. The first portion of the provision prohibits acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The second portion of this provision prohibits the treatment plant from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT

The third portion of this provision prohibits certain types of discharges unless the treatment plant receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

OUTFALL EVALUATION

Proposed permit Condition S.8 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

Economic and Engineering Services, Inc.

1992. Carlyon Beach Homeowners Association Wastewater Treatment Plant Engineering Report. 41500

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1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

H.R. Esvelt Engineering

1996. Wastewater Treatment Plant Addendum to Engineering Report.
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Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Parametrix, Inc.

1995. Carlyon Beach Homeowners Association Wastewater Treatment Plant Amendment to Engineering Report. PMX #21-2689-01

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Health.

1997. Carlyon Beach STP shellfish Closure Zone Letter. By Frank Meriwether

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on May 18, 2001, in *The Olympian* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on July 16, 2002, in *The Olympian* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Administrator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6278, or by writing to the address listed above.

This permit and fact sheet were written by Dave Dougherty

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅ – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

*FACT SHEET FOR NPDES PERMIT WA0037915
CARLYON BEACH WASTEWATER TREATMENT PLANT*

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov>.

Reasonable Potential Calculations

		State Water Quality Standard		Max concentration at edge of...		
	Ambient Concentration (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?
Parameter	ug/L	ug/L	ug/L	ug/L	ug/L	
Ammonia	0	2330.0000	350.0000	0.42	0.42	NO

Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
	<i>Pn</i>	ug/L	<i>CV</i>	<i>s</i>	<i>N</i>			
0.95	0.050	25.00	0.60	0.55	1	6.20	366	366

APPENDIX D--RESPONSE TO COMMENTS

No comments received.